








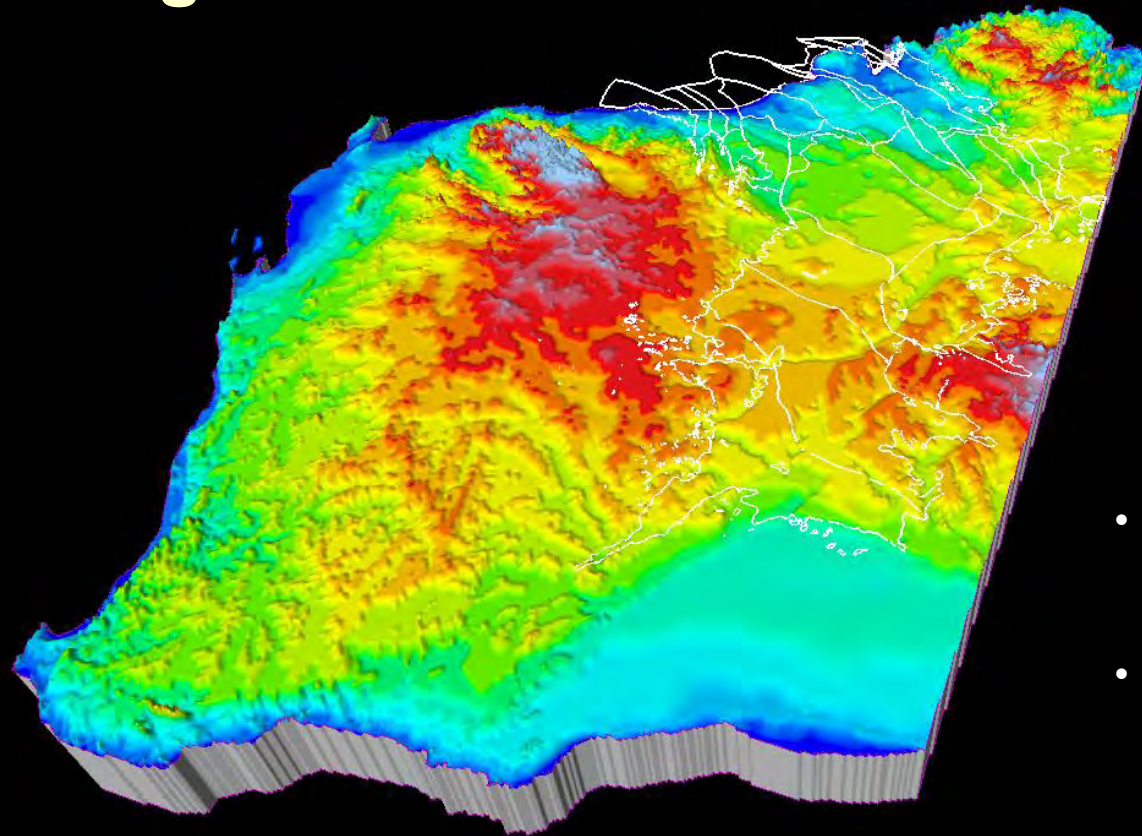
Government of Western Australia
Department of Mines, Industry Regulation and Safety

Kidson Sub-basin Seismic Survey

Content

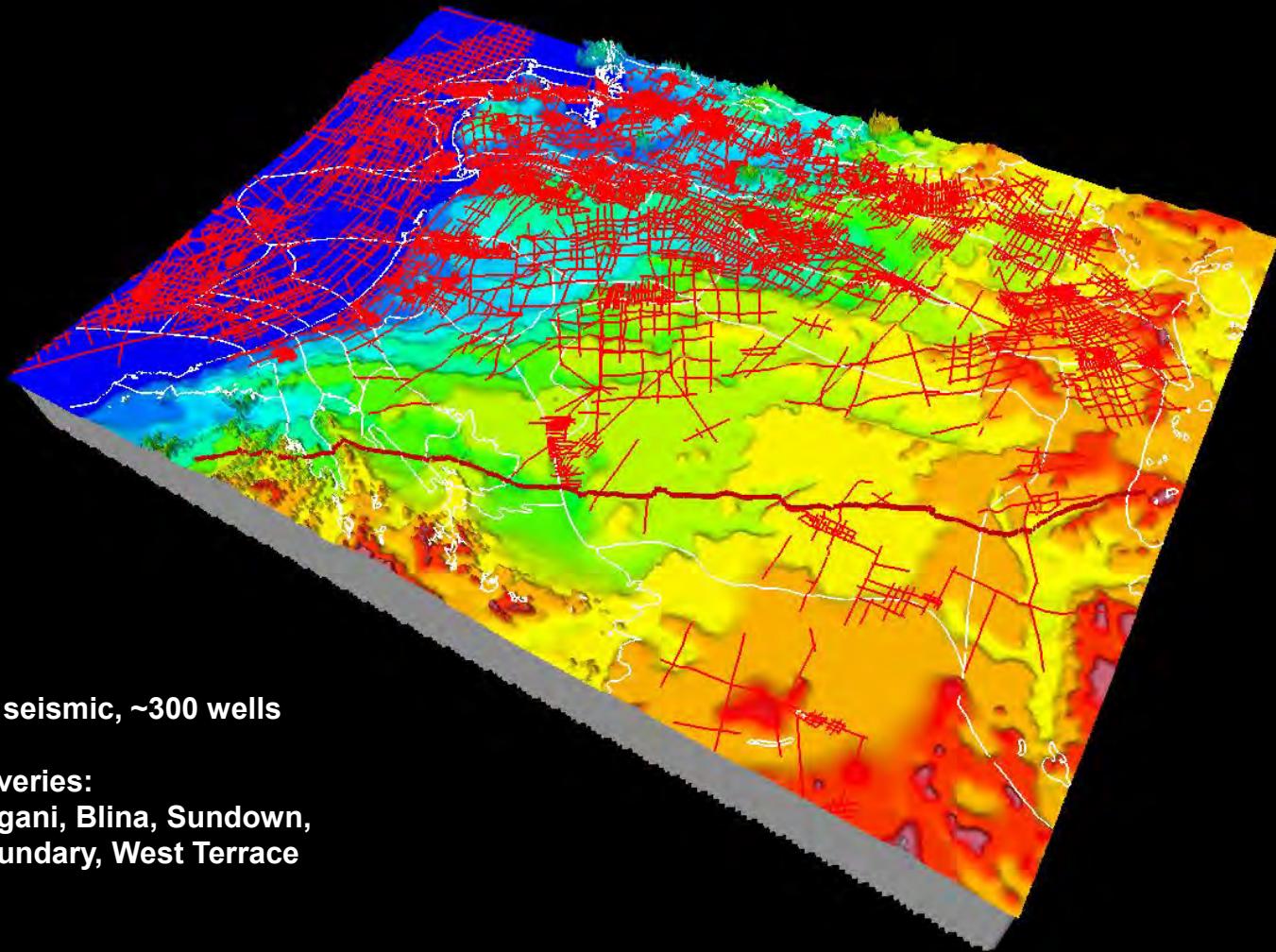
-  **Canning Basin overview**
-  **Project planning and funding**
-  **Seismic acquisition and processing**
-  **Preliminary seismic interpretation**
-  **Conclusion**

Canning Basin overview



- Mostly onshore intracratonic basin
- Ordovician to Cretaceous





Data:

2D seismic, ~300 wells

Discoveries:

Ungani, Blina, Sundown,
Boundary, West Terrace



Kidson Sub-basin seismic survey

- **Project:** deep seismic reflection survey
- **Location:** along the road from Kiwirrkurra community to Marble Bar, 872 km
- **Aims:** Phanerozoic and Proterozoic basins, basement structure underneath, including West Arunta Orogen, the Paterson Orogen and the Pilbara Craton, and the nature of their boundaries



YZ151

23.03.18

Participants and funding

Commonwealth Government (Geoscience Australia, GA, EFTF)

WA Government (GSWA, EIS)



- Designed to increase investment in minerals, energy and groundwater resources with a focus on Northern Australia, and also South Australia.
- The drivers on the Australian Government's White Paper: "The north has untapped promise, abundant resources and talented people. It is also Australia's closest connection with our key trading markets and the global scale changes occurring in Asia."
- To encourage exploration in WA for the long-term sustainability of the State's resources sector.
- To focus in underexplored greenfield regions.
- To stimulate increased private sector resource exploration, leading to new mineral and energy discoveries.
- To increase knowledge of the State's geology and resources, and help increase employment opportunities.



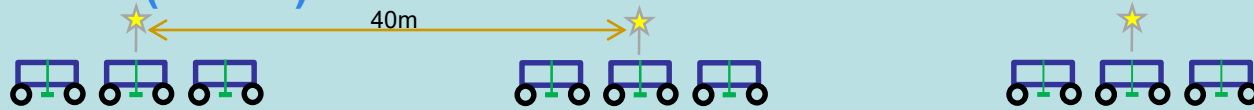
EXPLORATION
INCENTIVE
SHEME

Stakeholder engagement

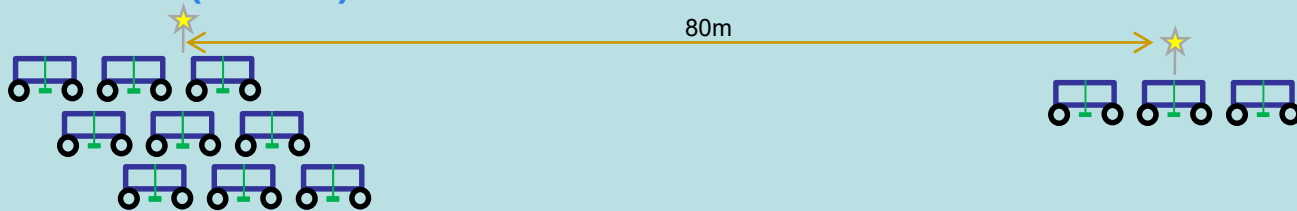


Sweeping tests for optimal result

Test 1 (1×24s)



Test 2 (3×12s)



Test 3 (3×12s)

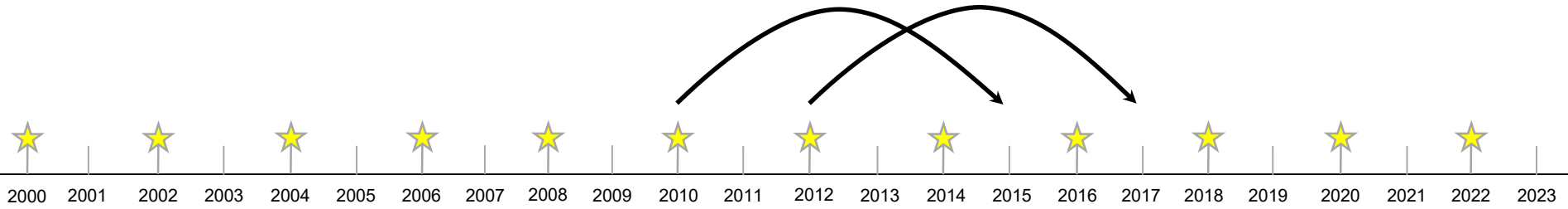


Test 4 (non-linear)

Infrastructure to avoid



Skips and make-ups



Station No.

make-up the folds via additional VPs before or after the skips.

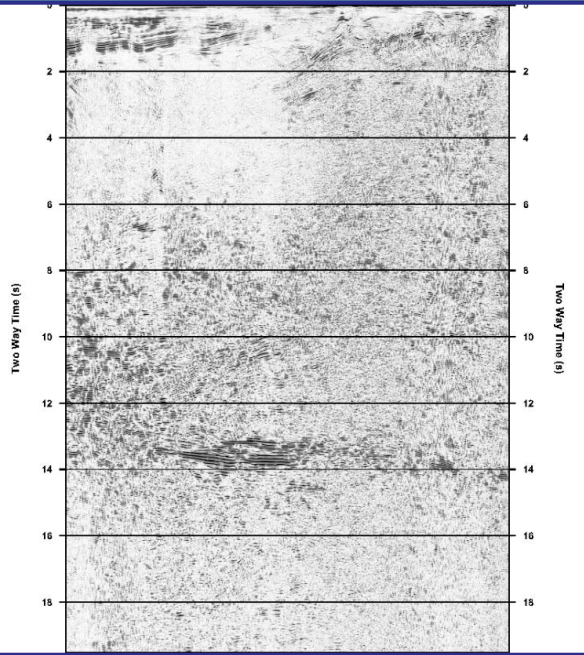
West

East



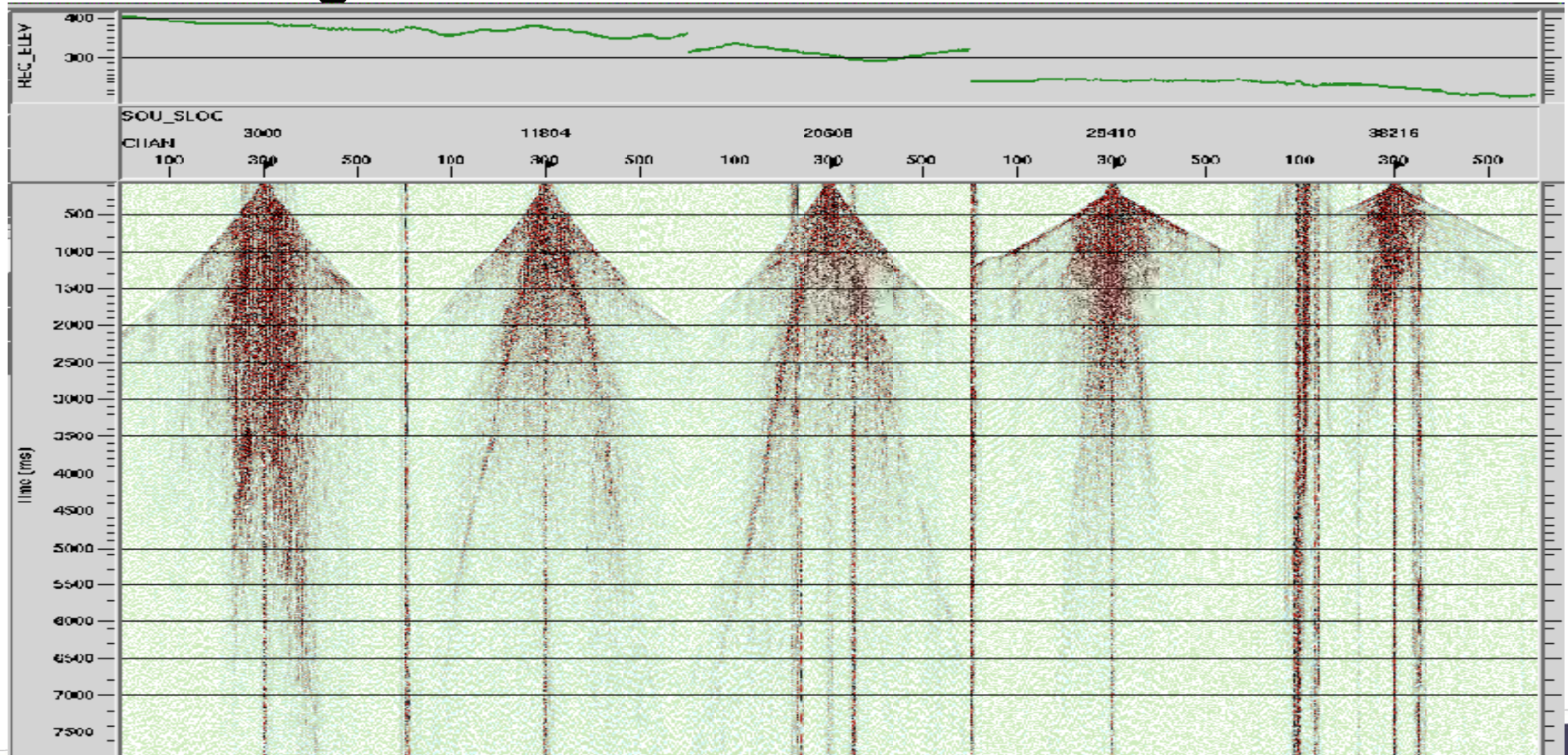
Acquisition: 16 km per day; maximum 22 km

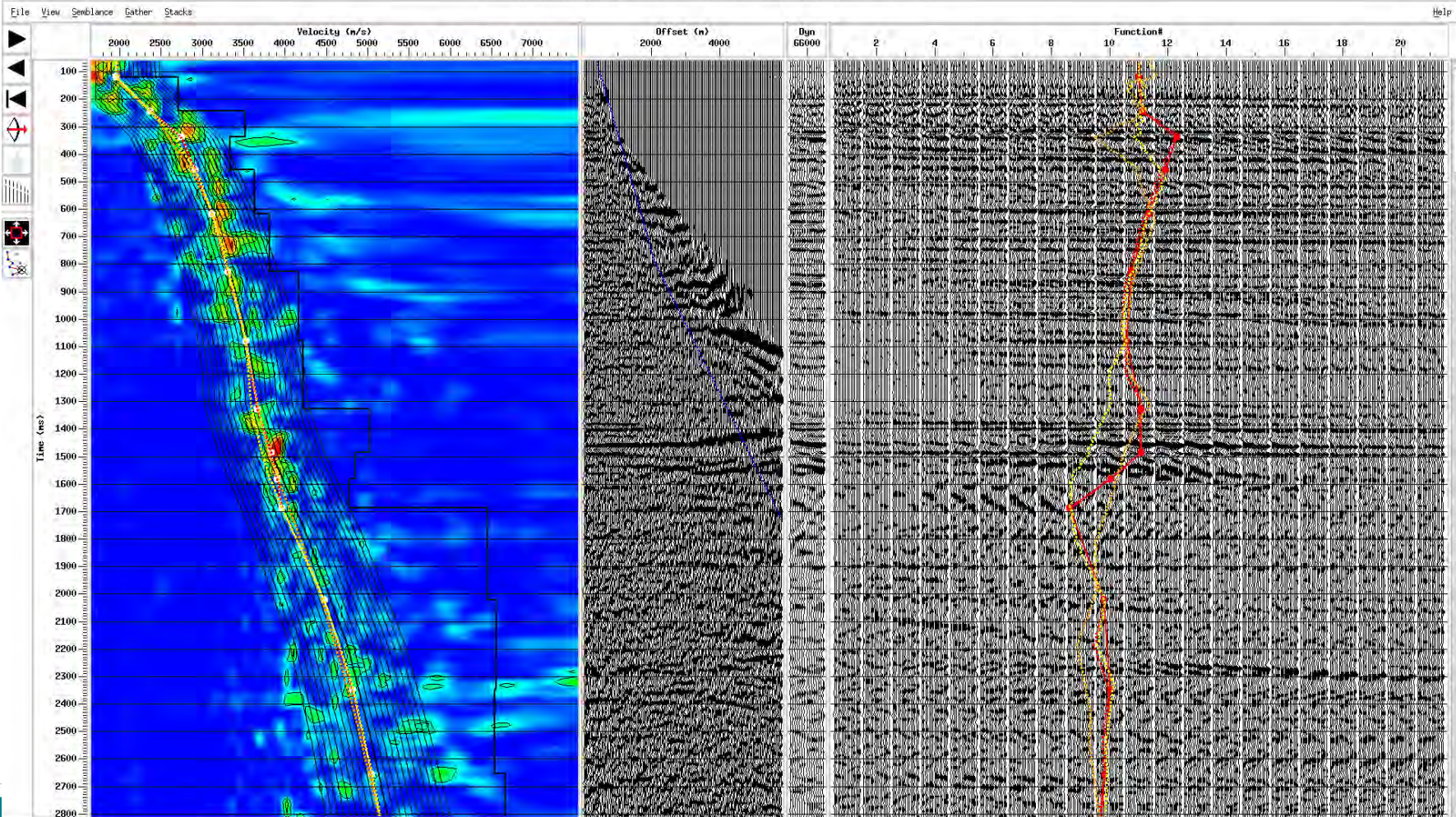
Field stack example



- Investigate the unknown geology and increase data coverage
- Identify regional faults, folds, salt movement, and other structural elements
- Establish the subsurface geology of the Canning Basin and the extent and nature of its sub-basins and trough
- Image the basement structure below the Kidson Sub-basin, including the extent of major tectonic units such as the Centralian Superbasin, the West Arunta Orogen, the Paterson Orogen and the Pilbara Craton, and the nature of their boundaries

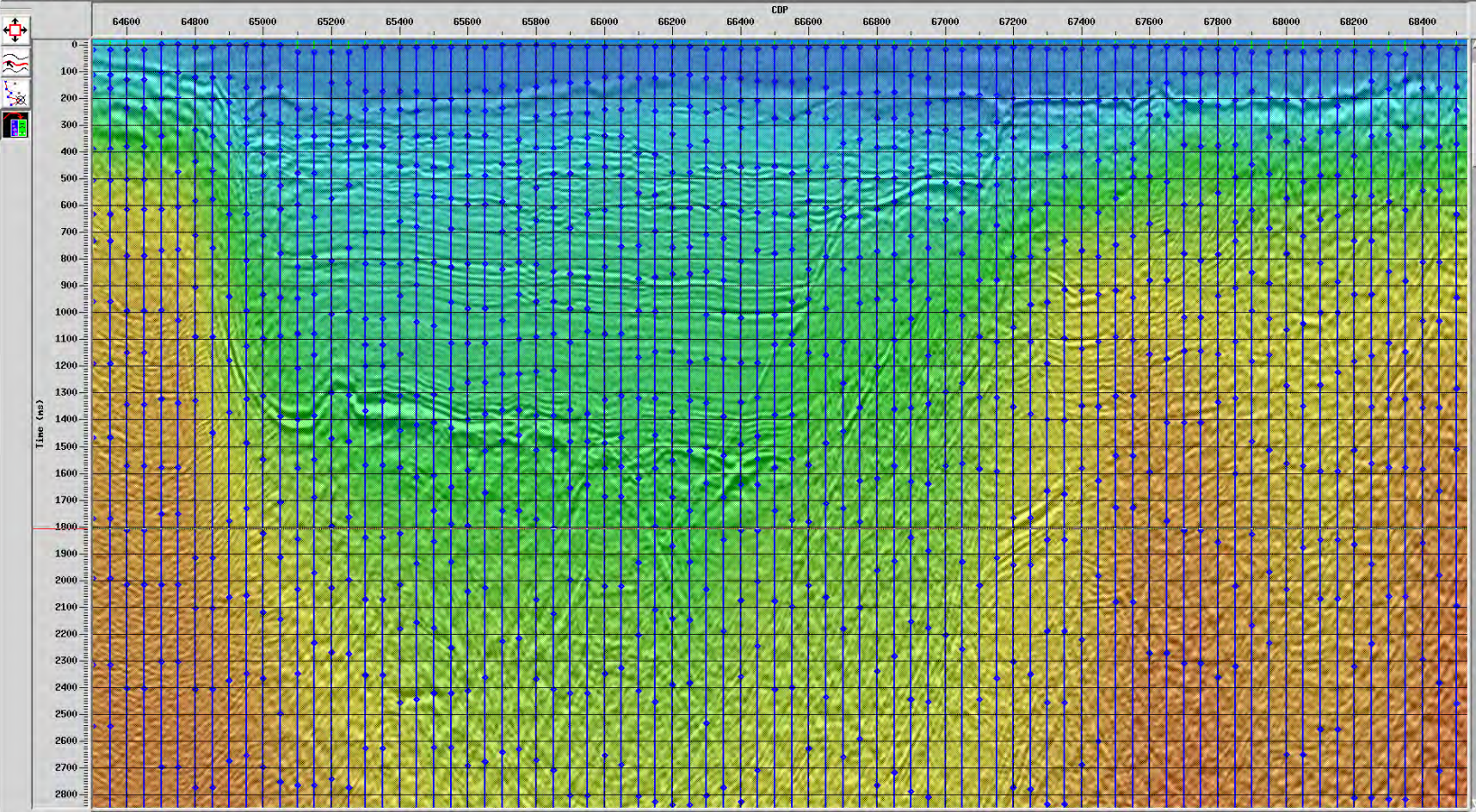
Processing

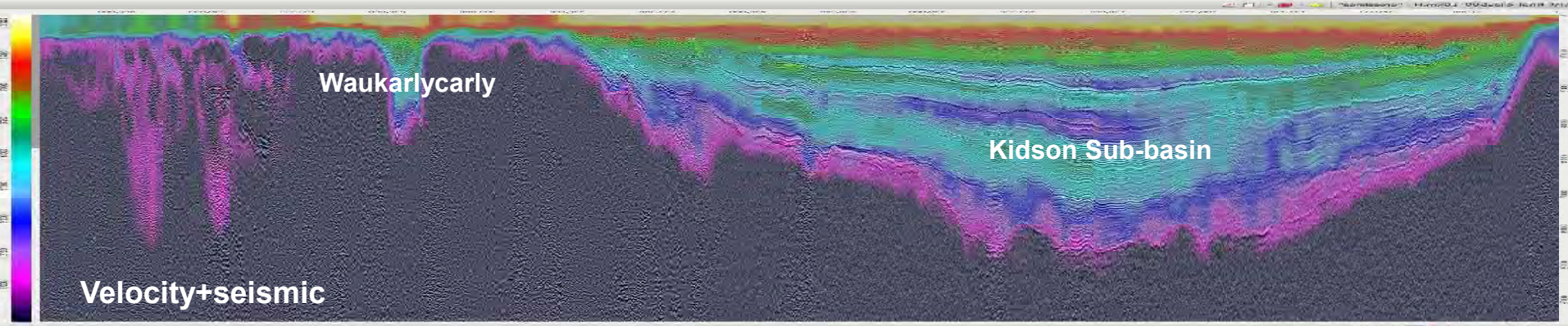
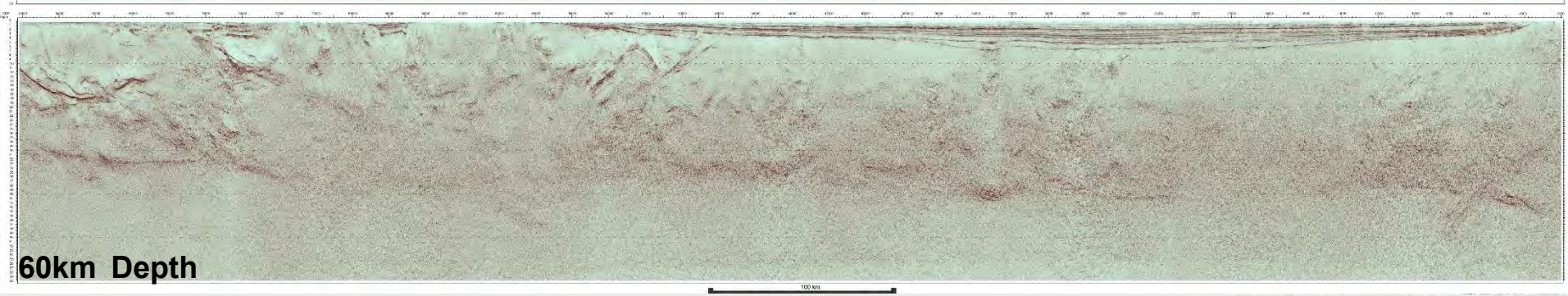
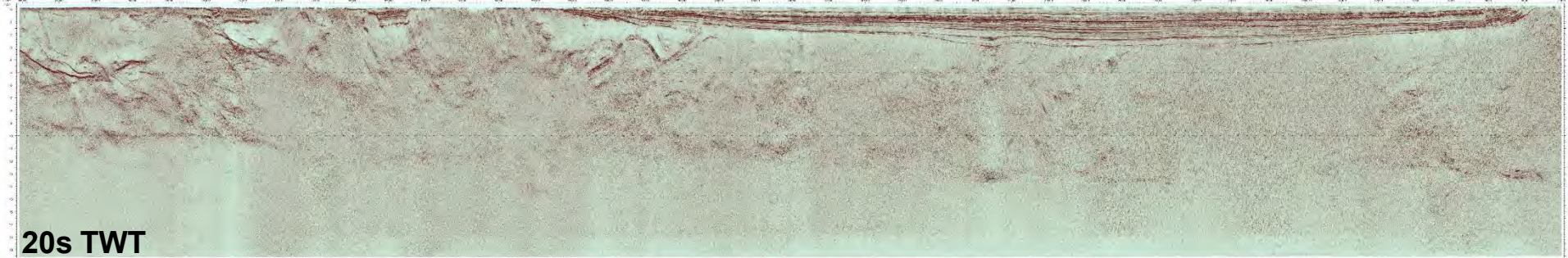




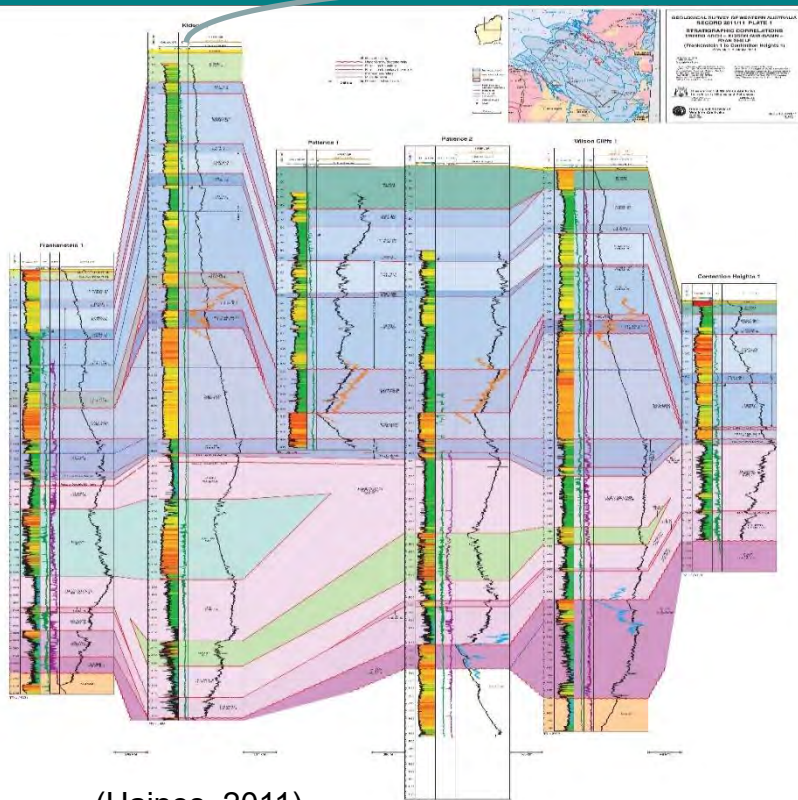
MB1: click-and-drag to zoom, click to unzoom, release outside to cancel

Zoom or unzoom



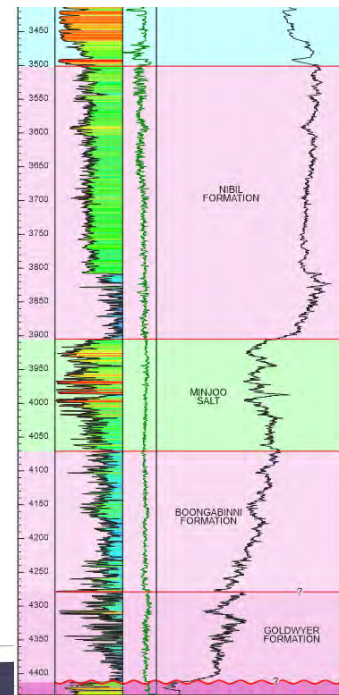
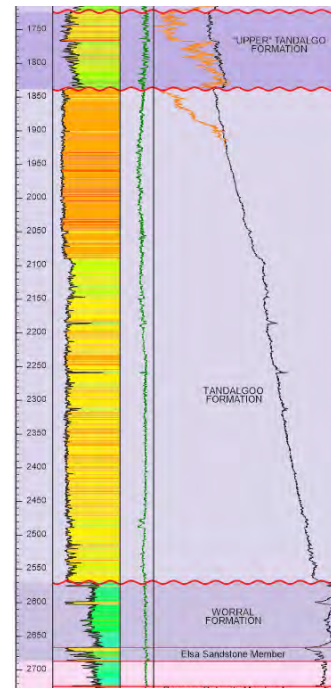
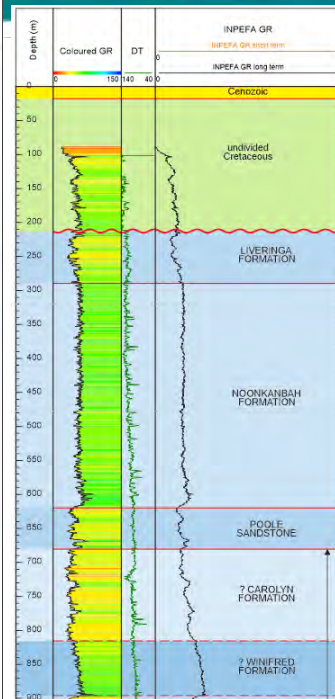


Preliminary seismic interpretation

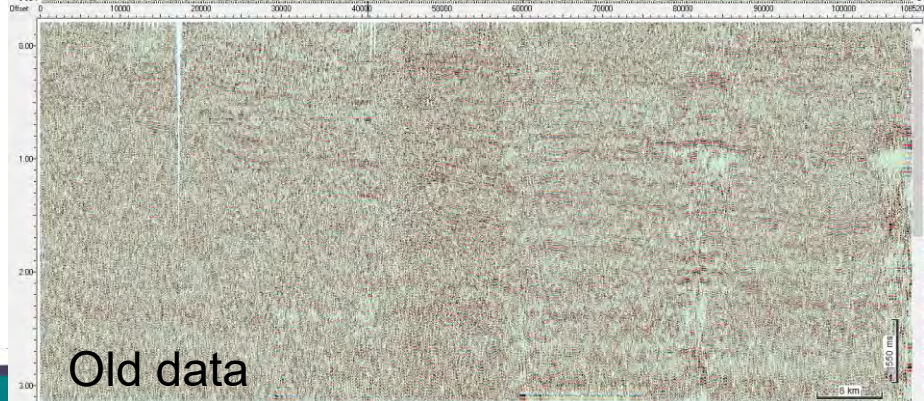
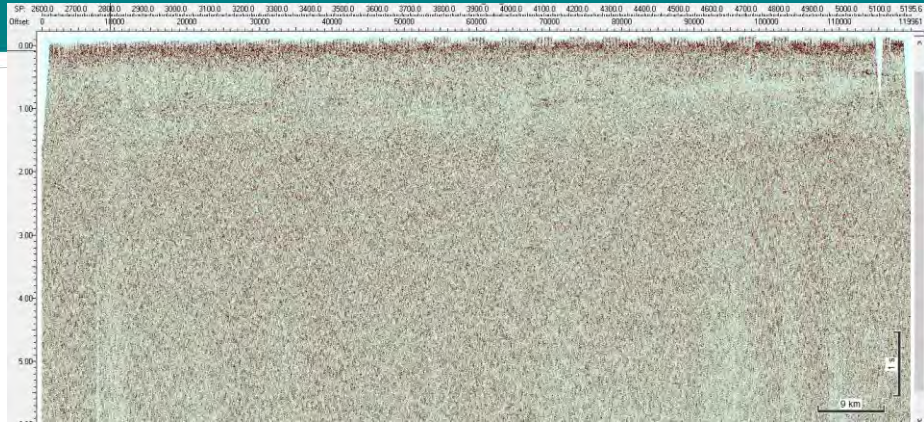
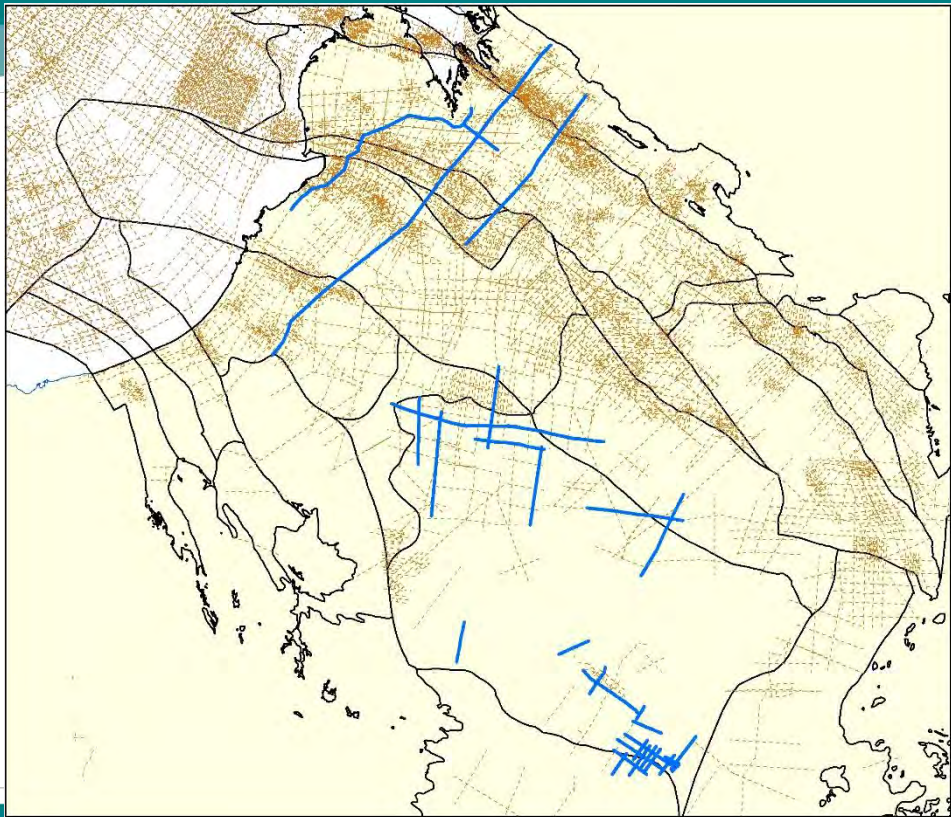


(Haines, 2011)

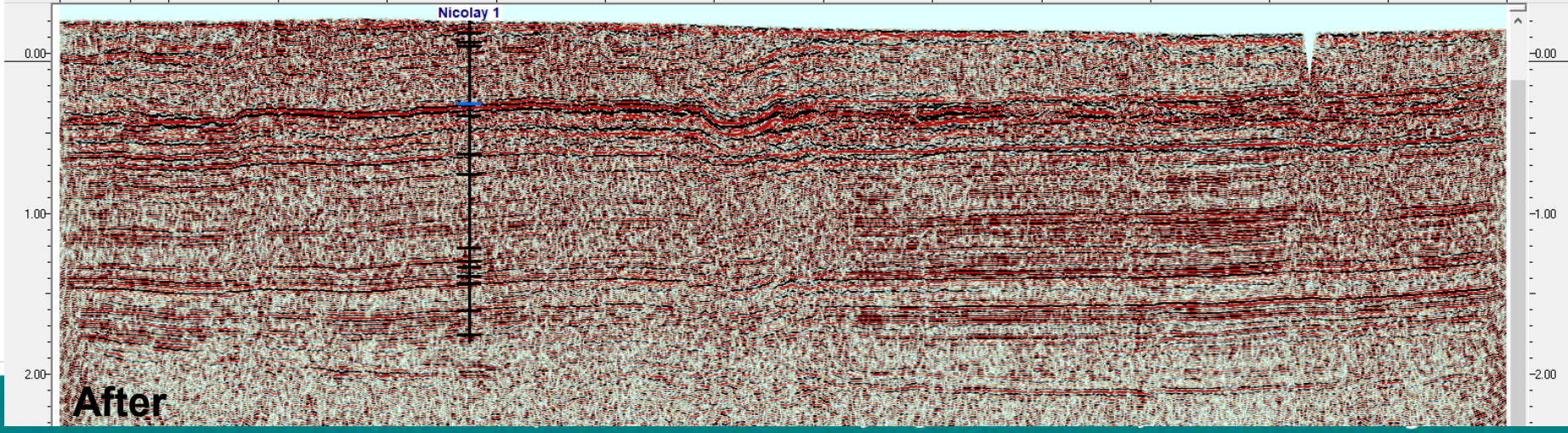
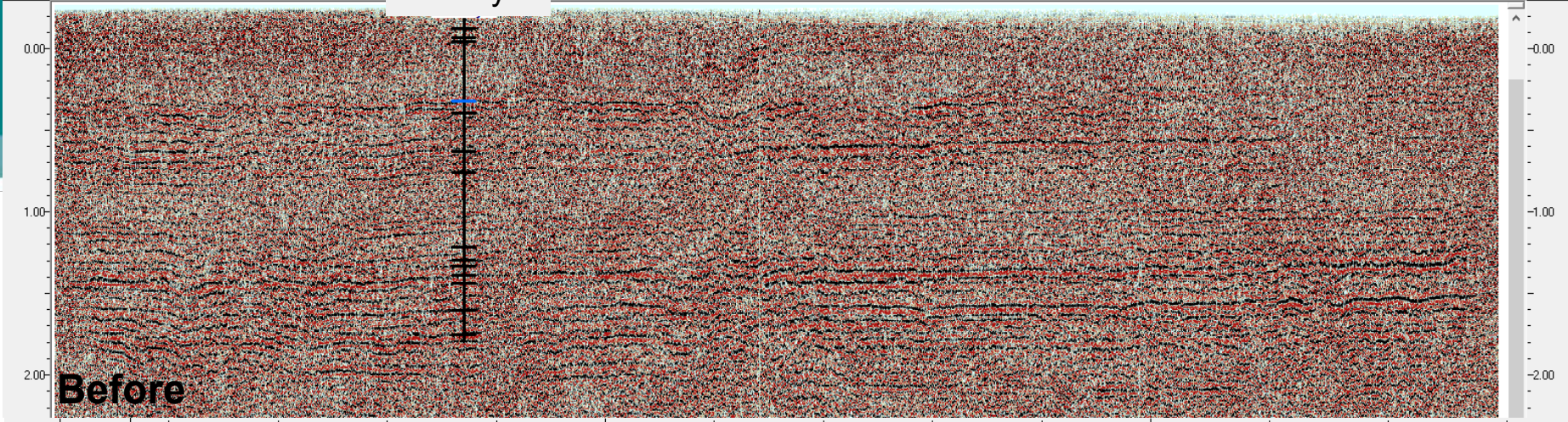
Kidson 1



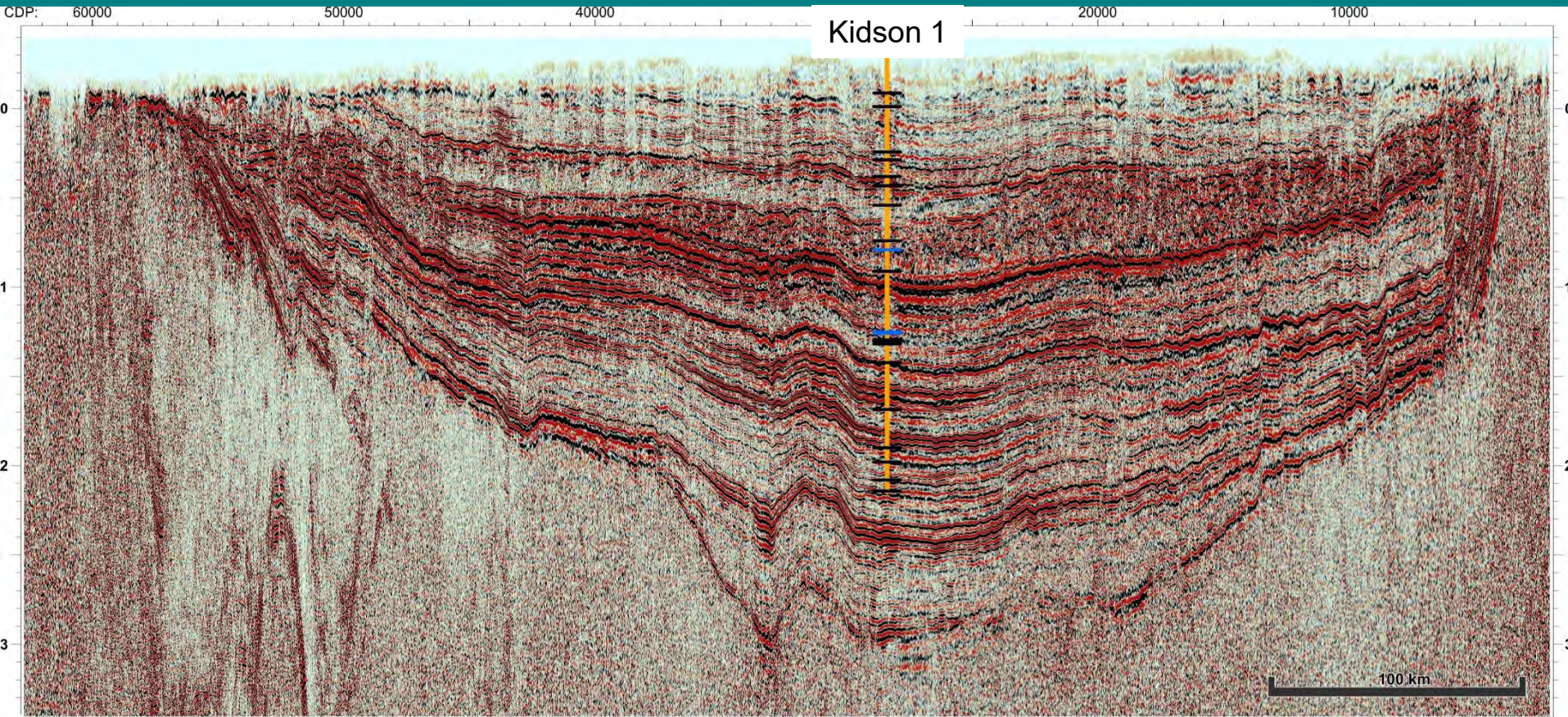
Supplemental data reprocessing



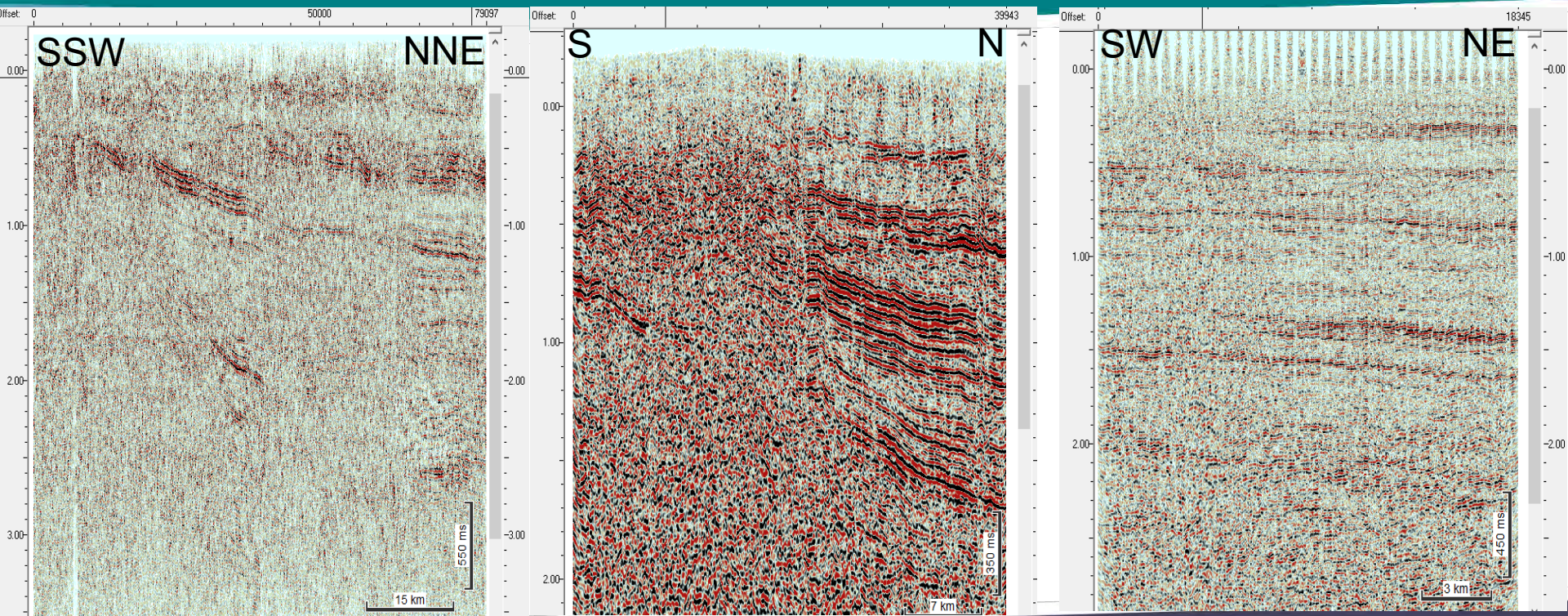
Nicolay 1

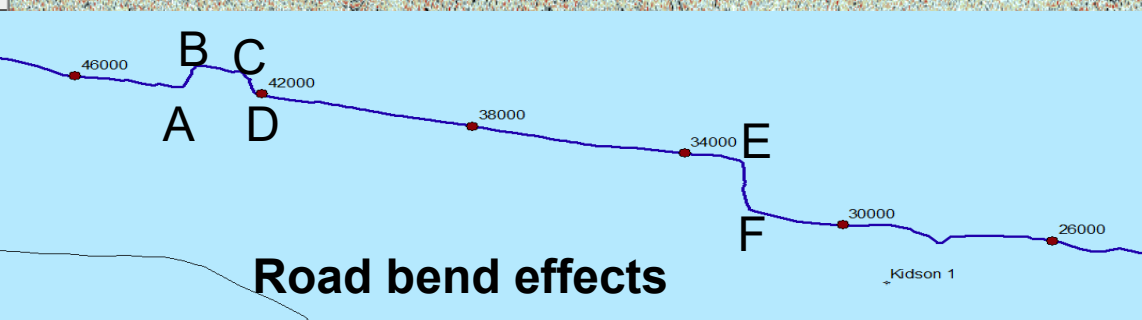
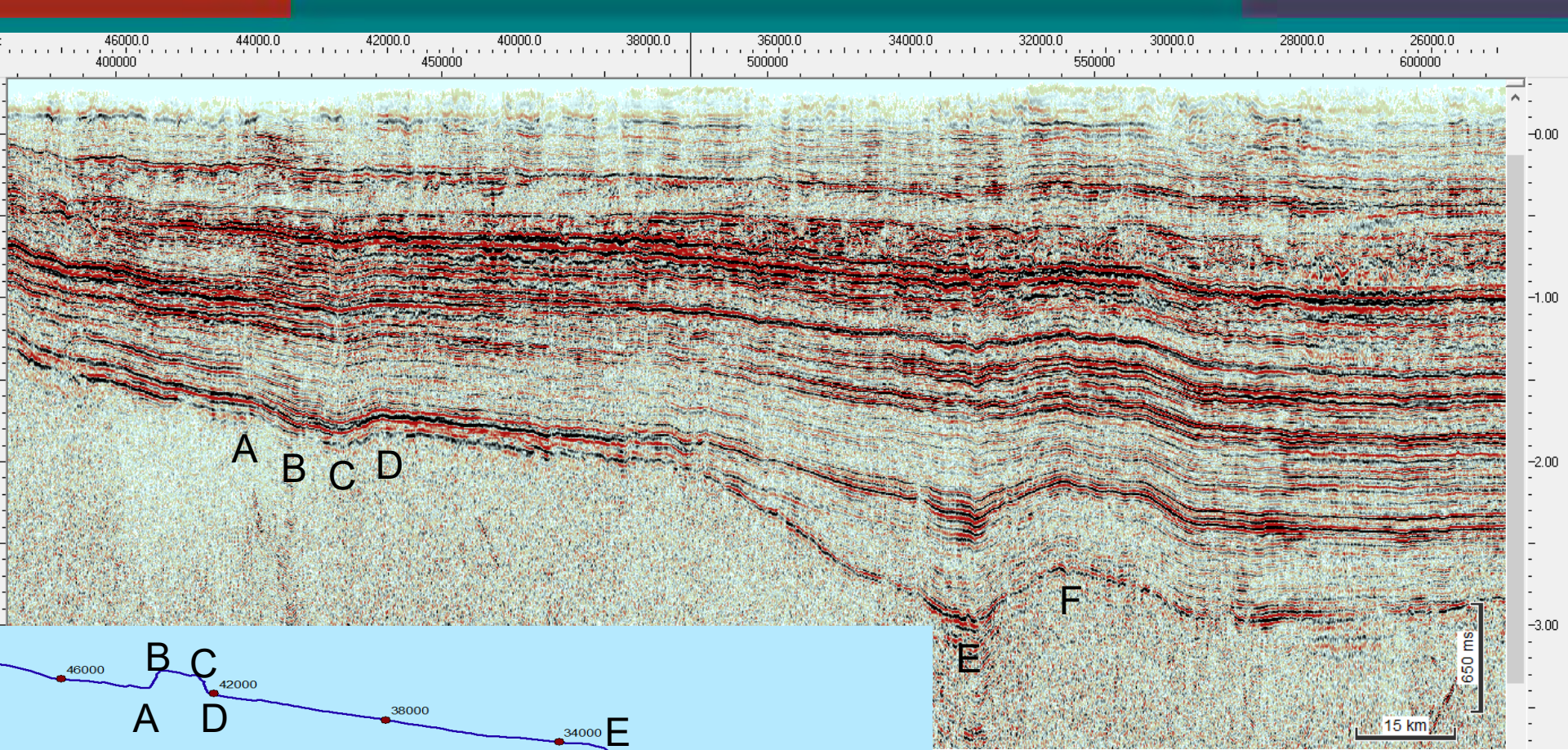


Well correlation



Dipping and correlation issue

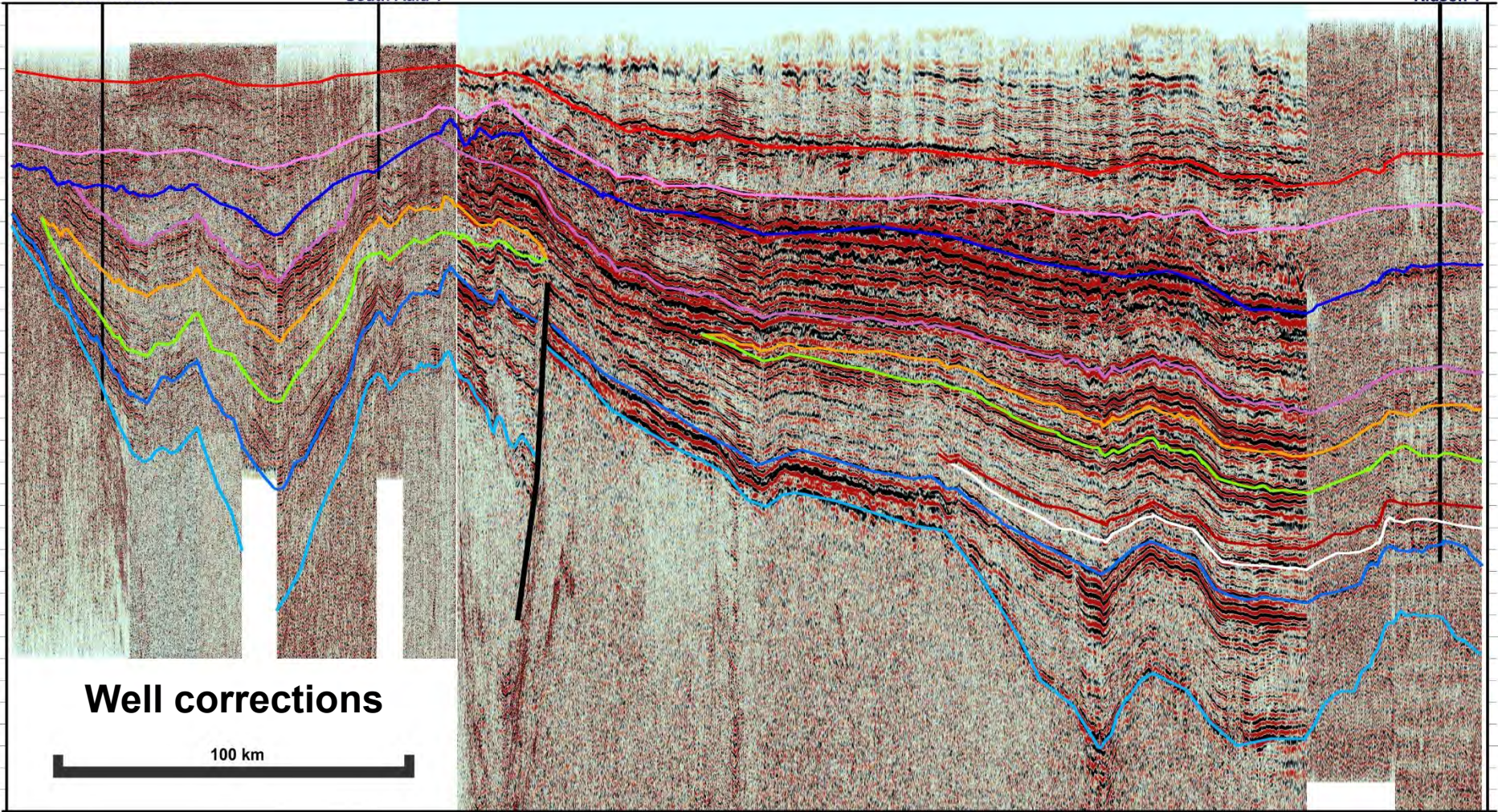




Frankenstein 1

South Auld 1

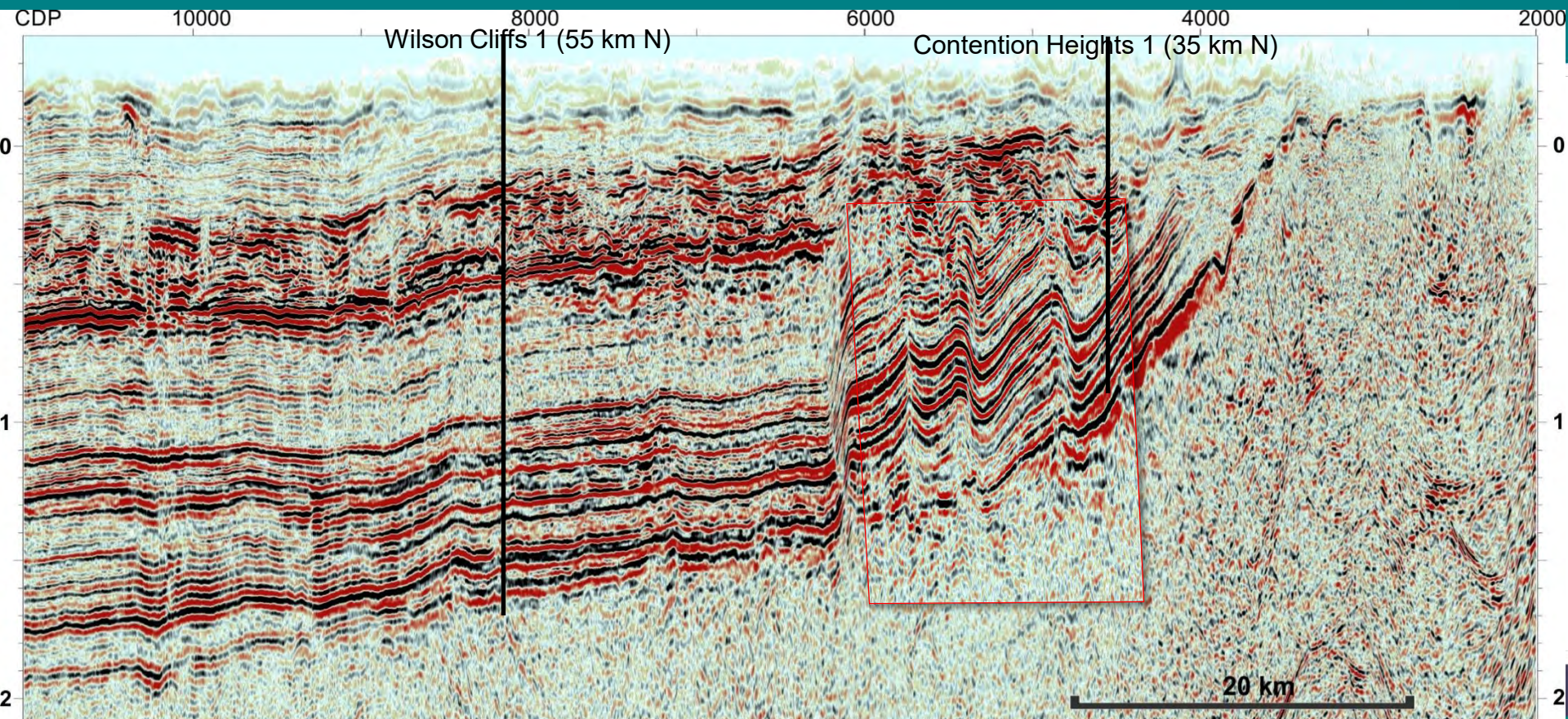
Kidson 1



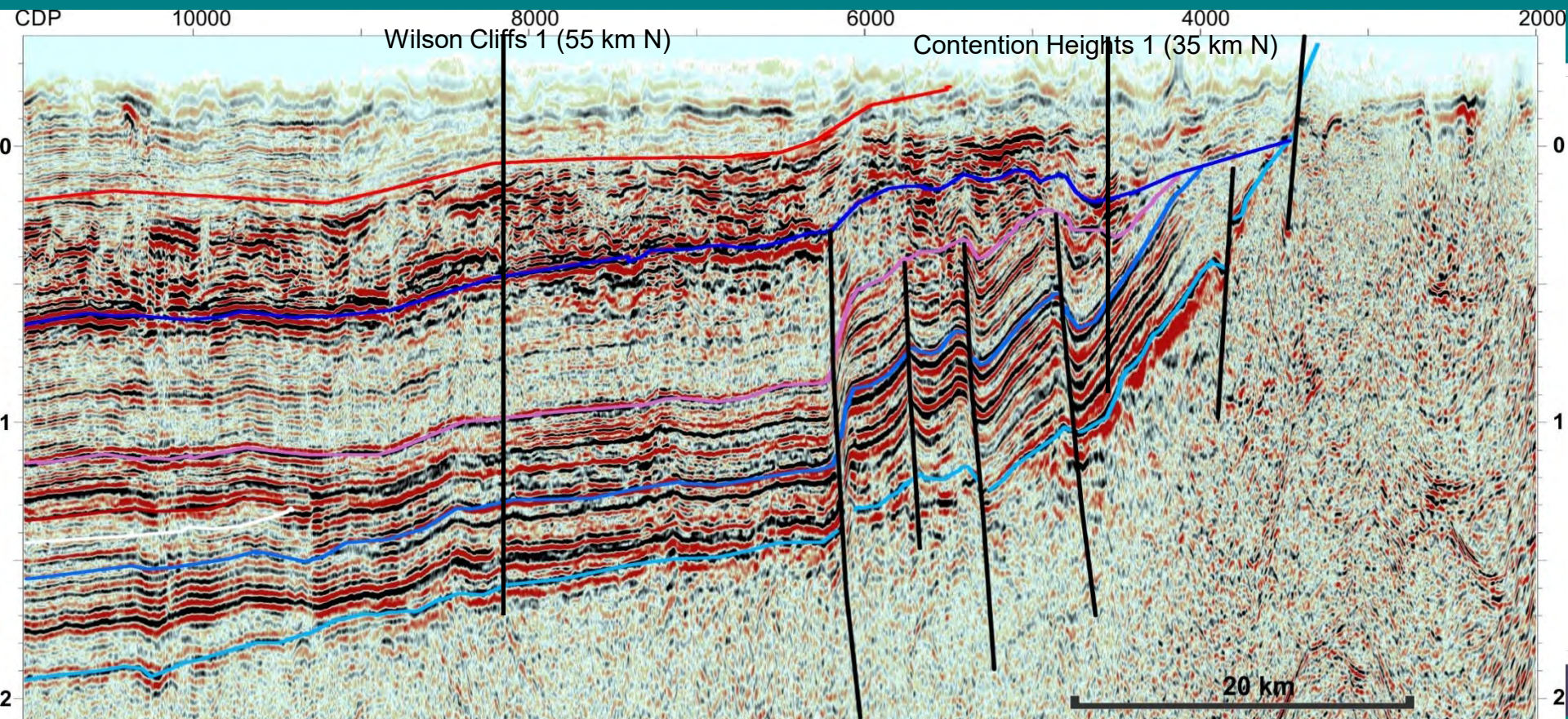
Well corrections

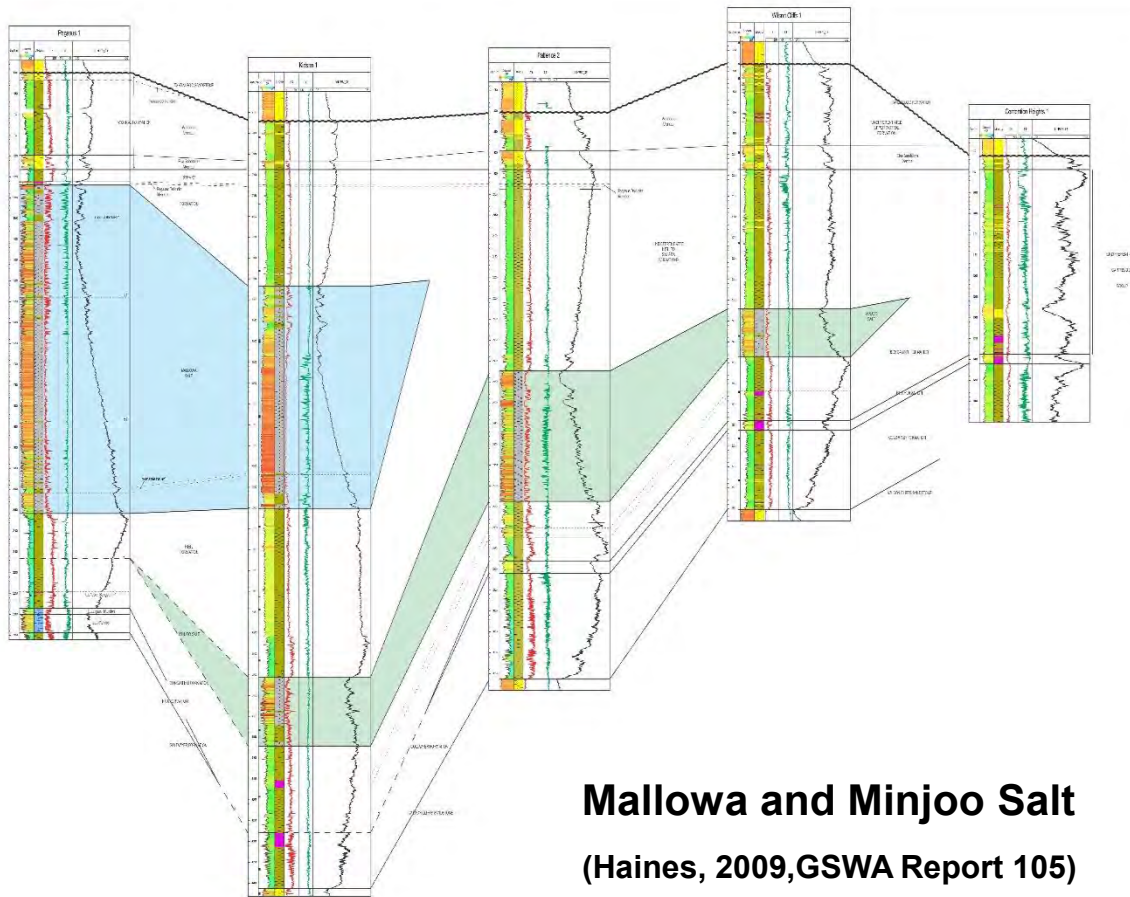
100 km

Eastern margin of Kidson Sub-basin

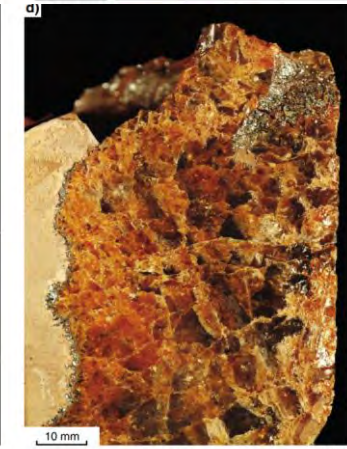


Eastern margin of Kidson Sub-basin

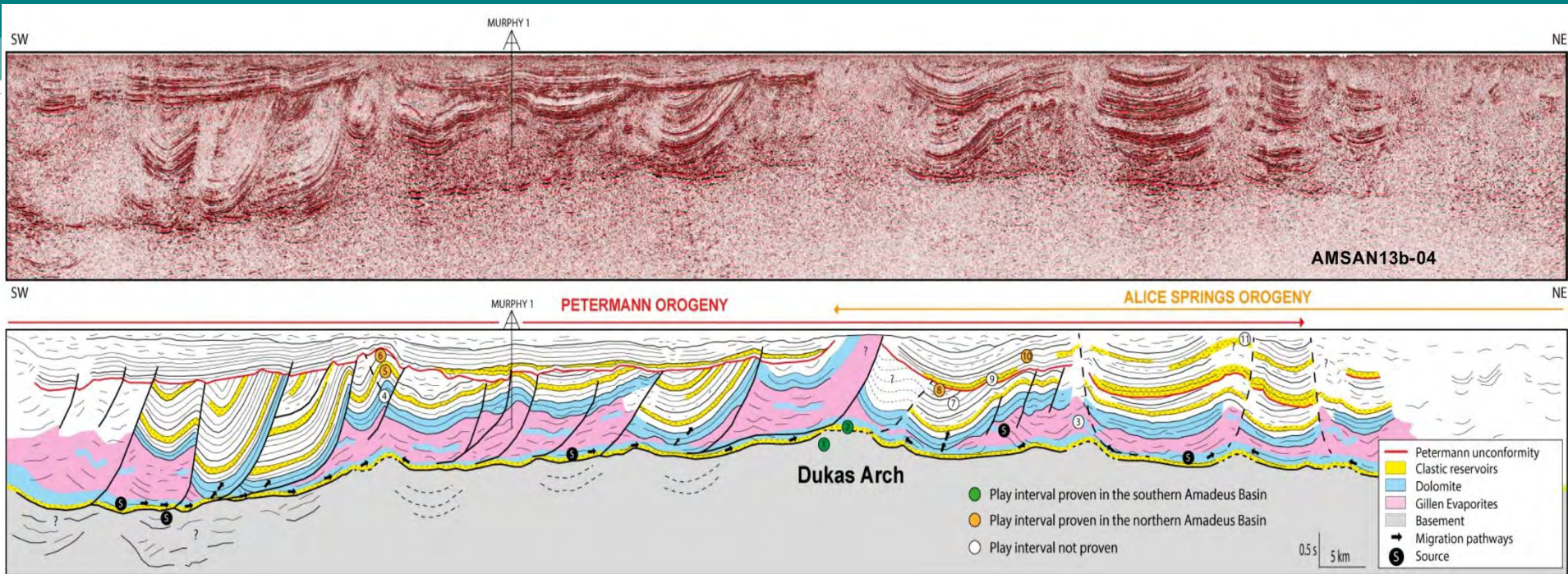




Mallowa and Minjoo Salt
 (Haines, 2009, GSWA Report 105)



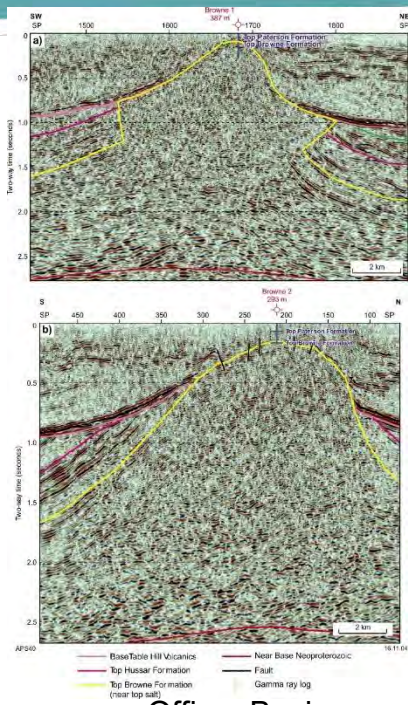
Salt comparison



(Menpes et al, 2018)

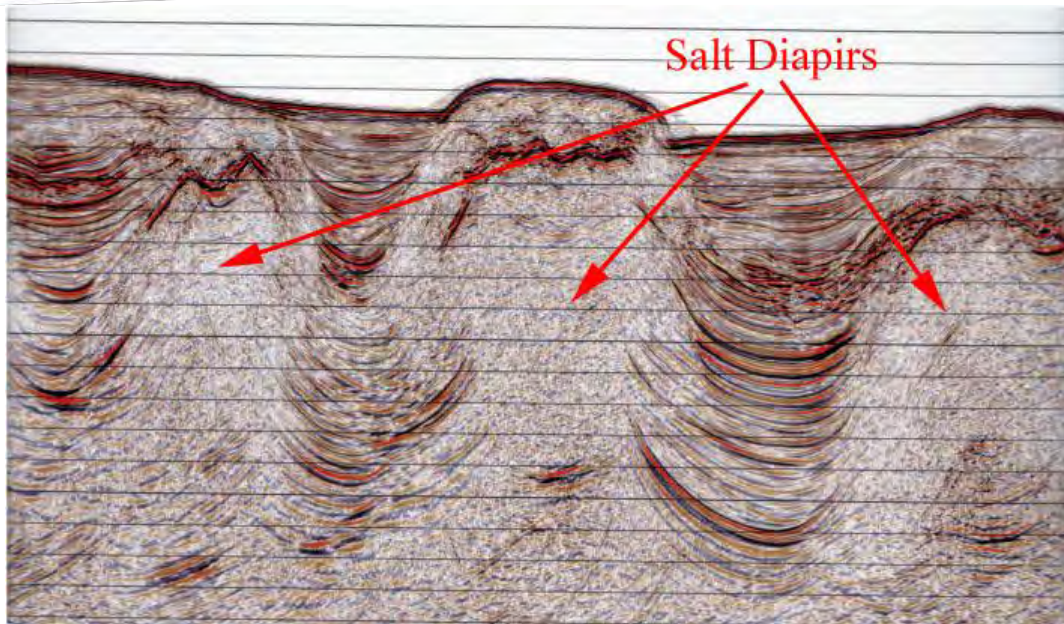
Amadeus Basin

Salt analogues



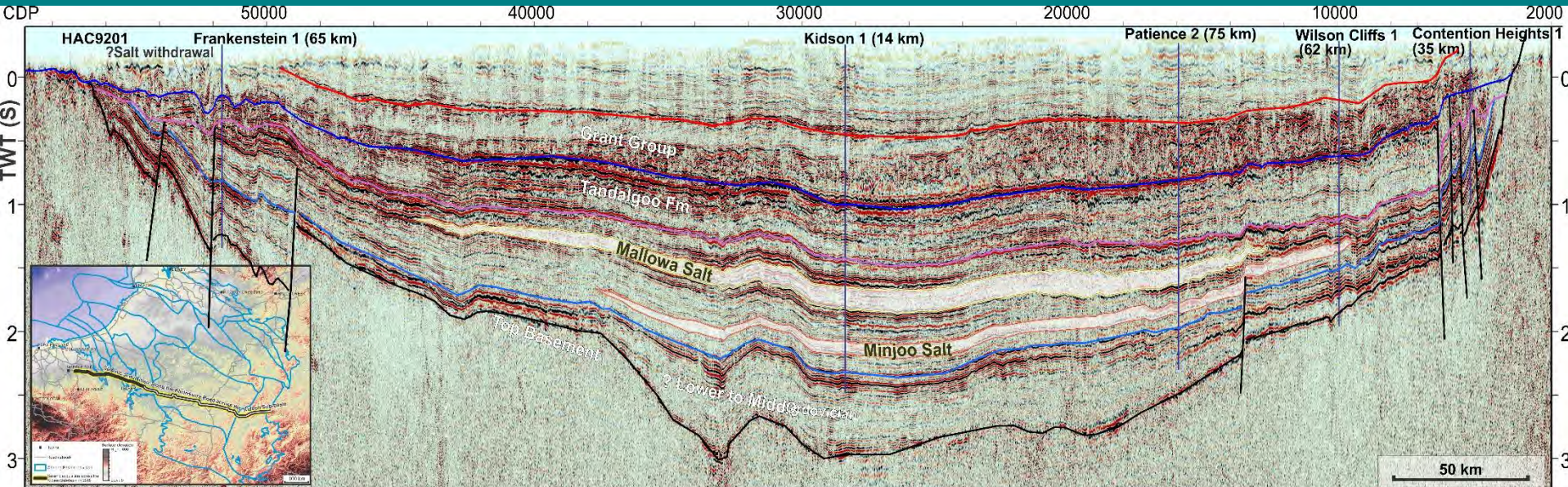
Officer Basin

(Simeonova & Iasky, 2005)

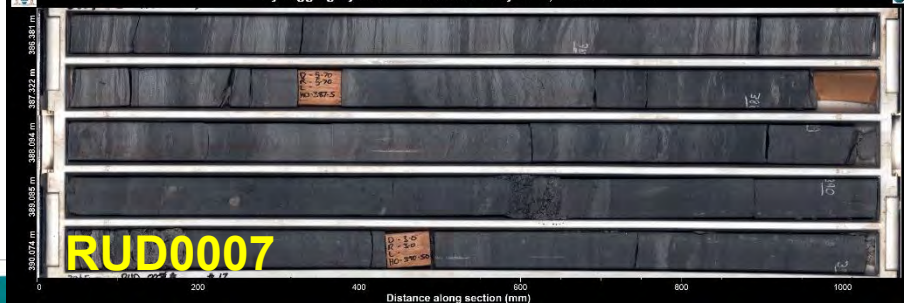


salt diapirs on the Brazil margin

Kidson Sub-basin



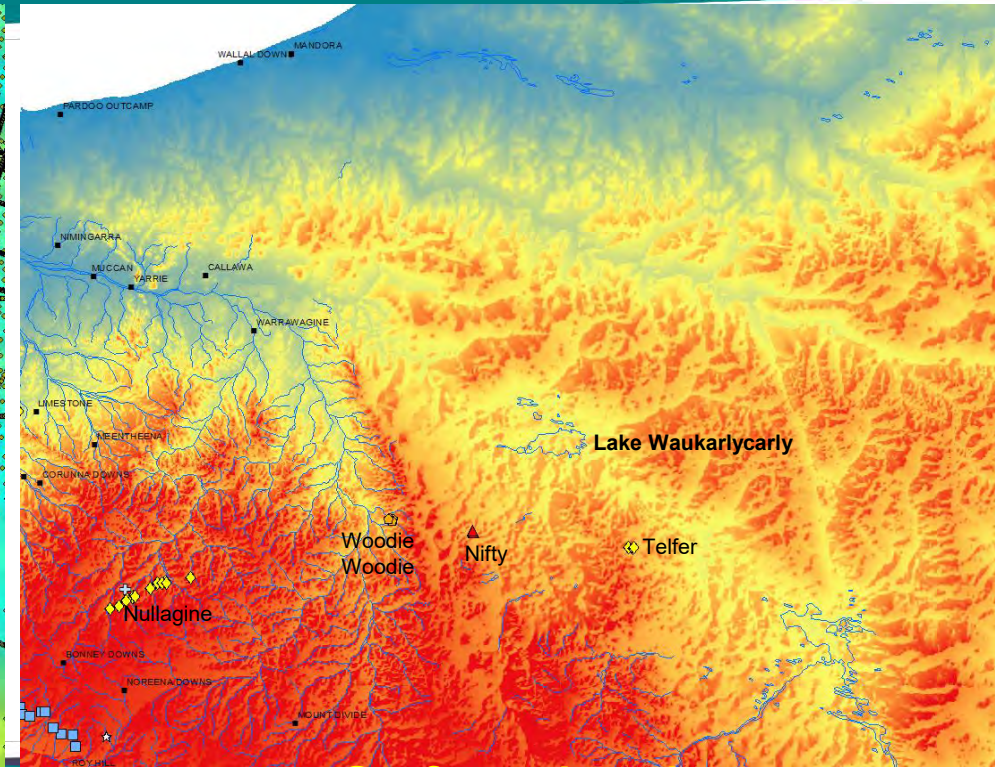
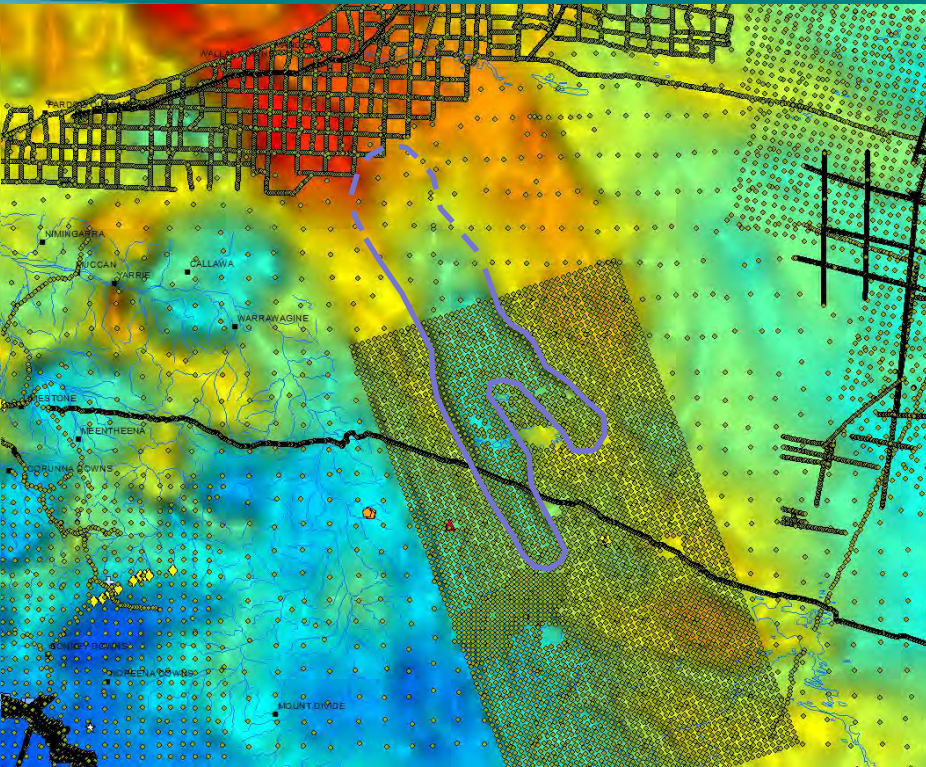
HyLogging Systems - RUD0007 Tray 0012, 386.4 to 391 m



HyLogging Systems - RUD0007 Tray 0022, 434.1 to 438.9 m



Waukarlycarly Embayment



Gravity

Surface elevation

Hunt Oil company in 1996:

...basin-margin rift complex...

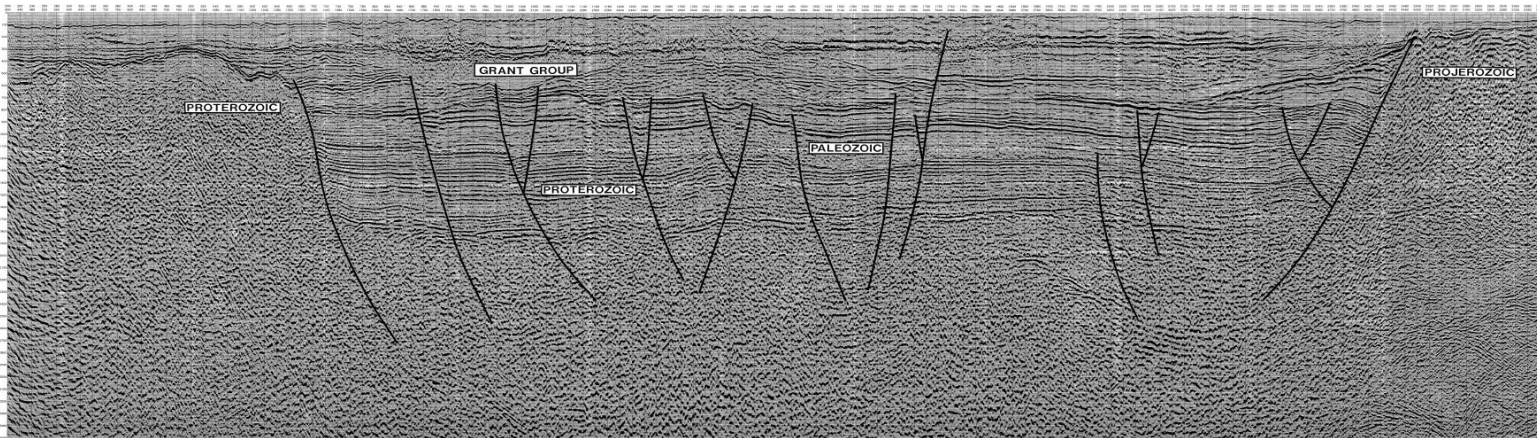
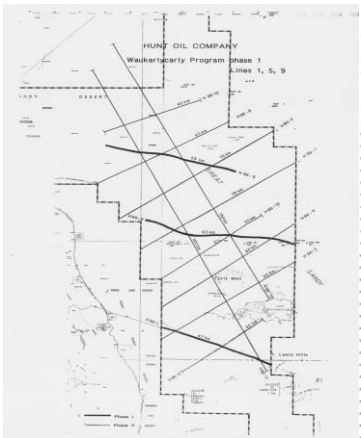
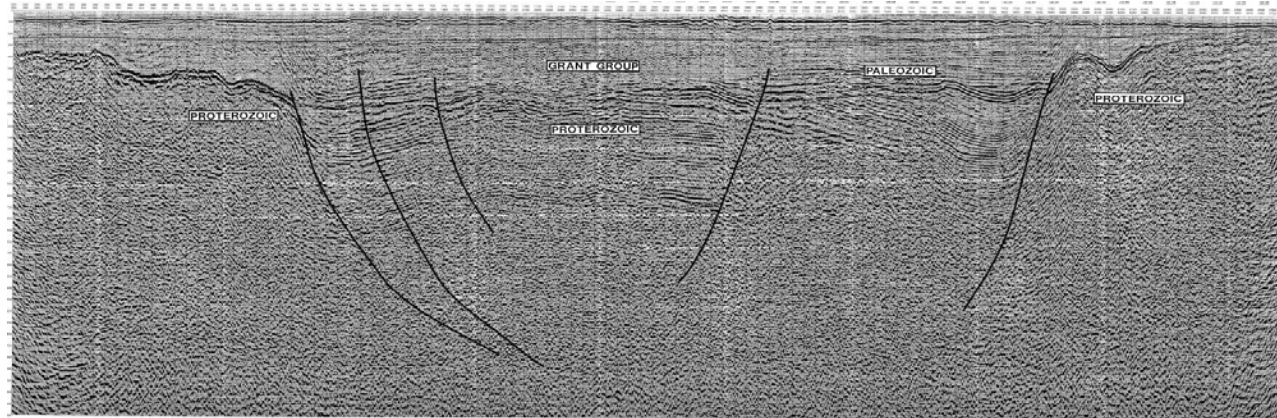
...anticipated to contain prospective Ordovician...

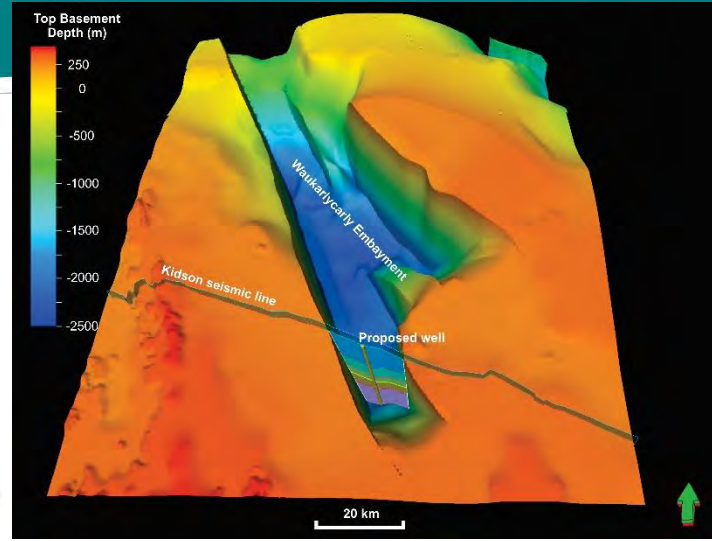
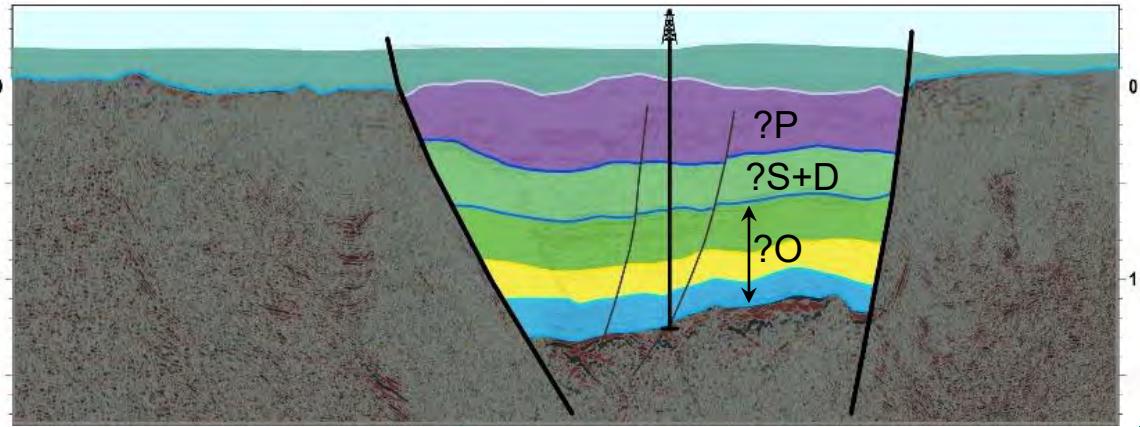
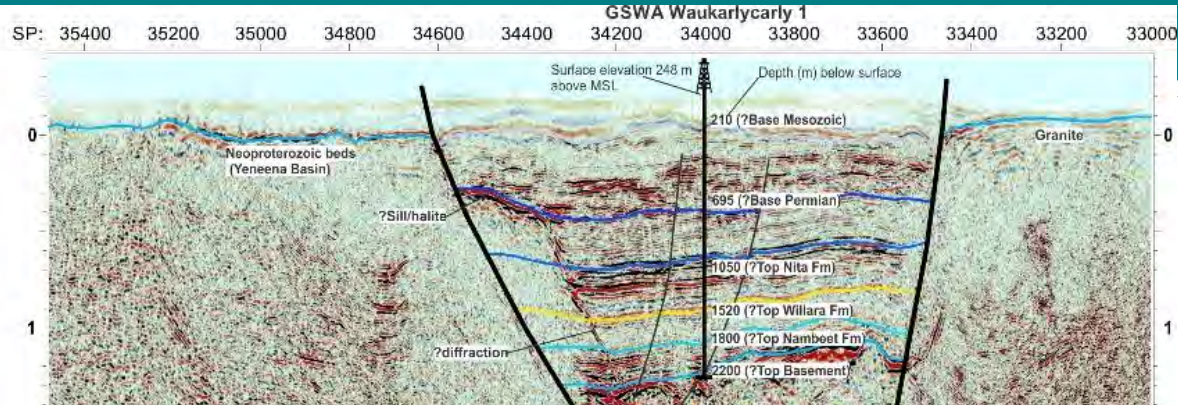
...forming potential oil source rocks, reservoirs & seals...

...not the case in the Waukarlyarly...

...not reveal any evidence of syn-rift deposition...

...not sufficient of itself to sustain exploration interest...

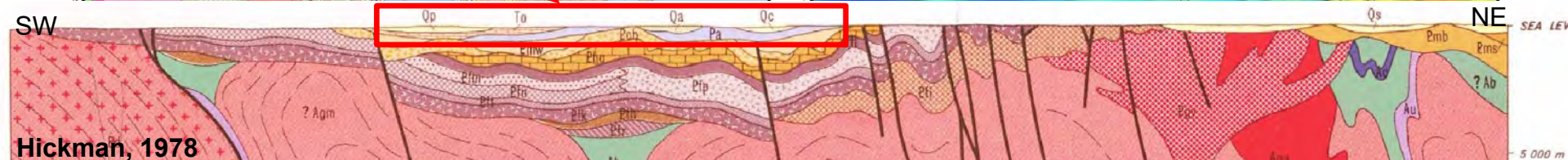
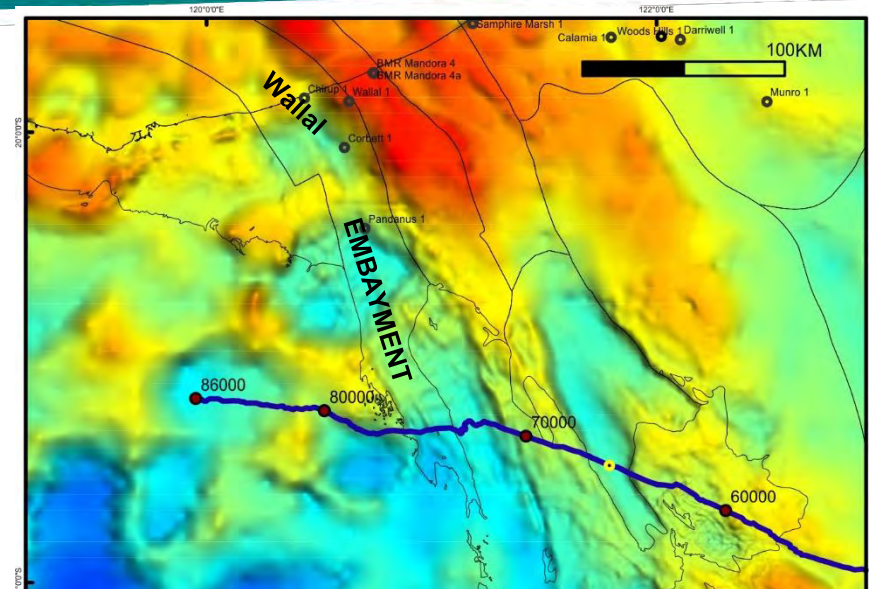
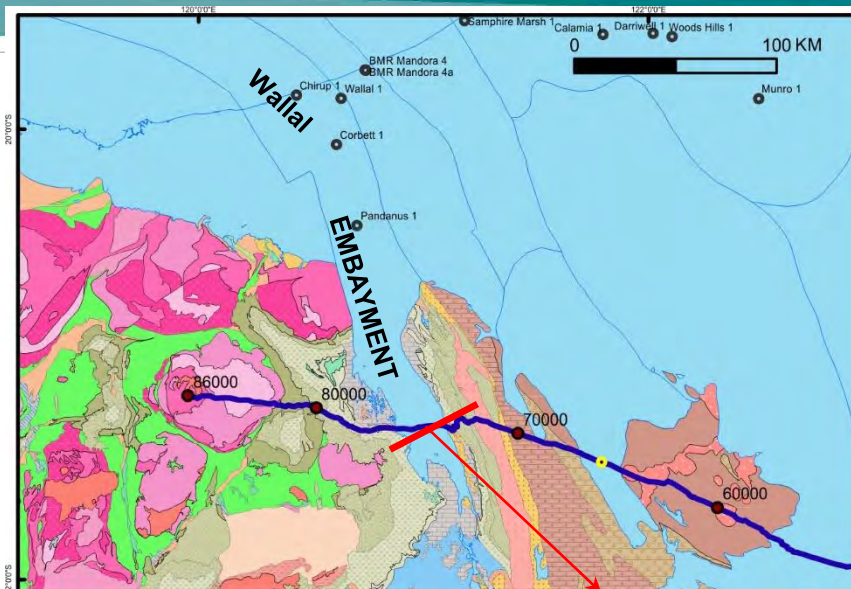




Funding: EFTF (GA)

Operator: GSWA

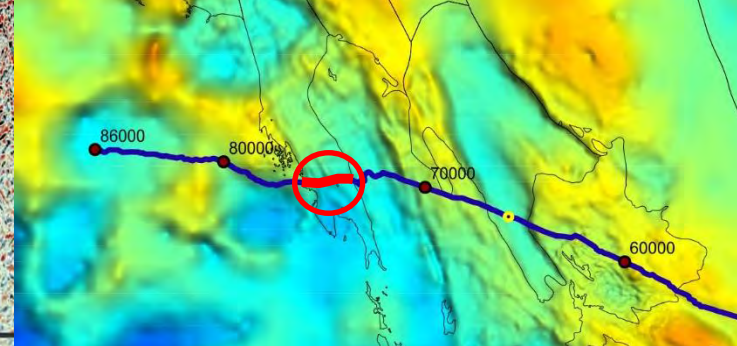
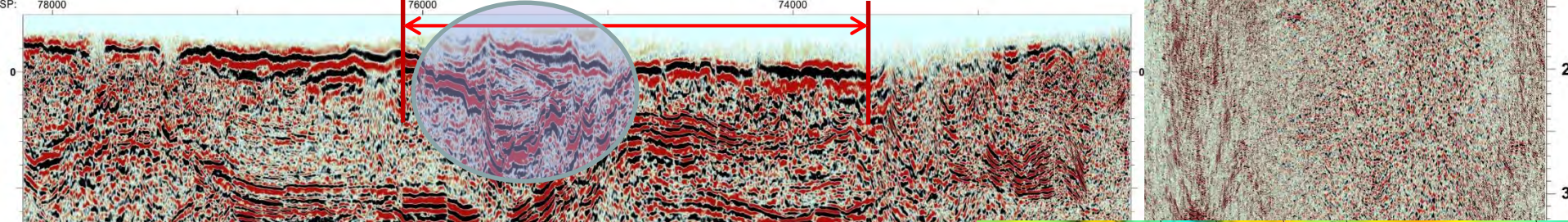
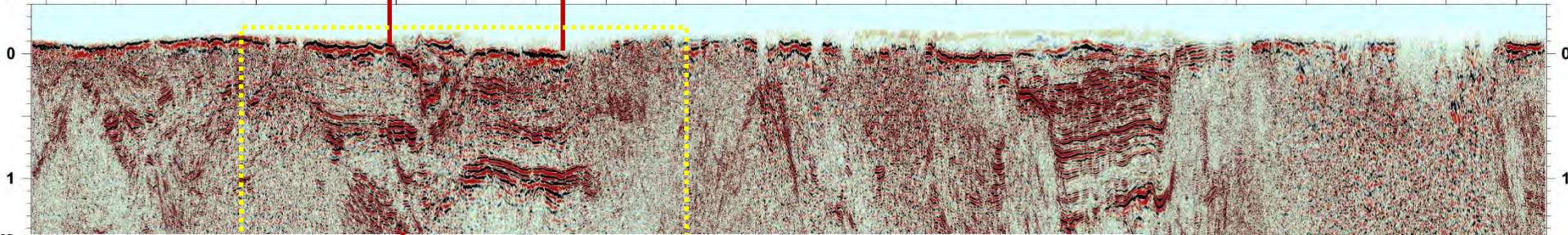
Wallal Embayment



Hickman, 1978

Wallal EMBAYMENT

CDP: 80000 78000 76000 74000 72000 70000 68000 66000 64000 62000 60000



Comparison between embayments

Wallal

Waukarlycarly

Waukarlycarly

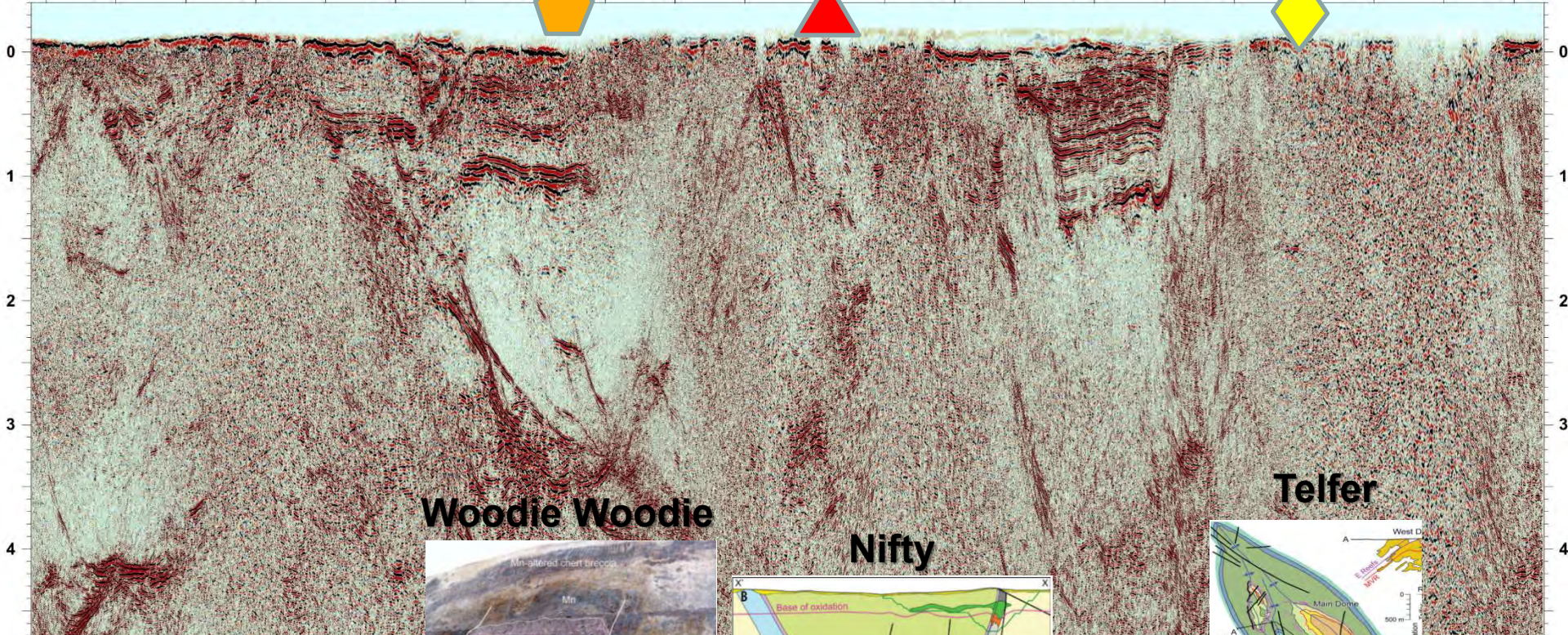
Wallal

Nearby operating mines Mn

Cu

Au, Cu

CDP: 80000 78000 76000 74000 72000 70000 68000 66000 64000 62000 60000

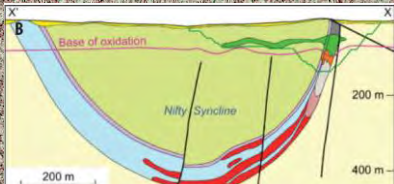


Woodie Woodie

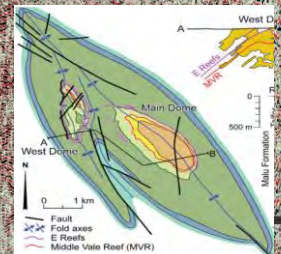


Jones, SA, 2017
Porter, TM, 2017

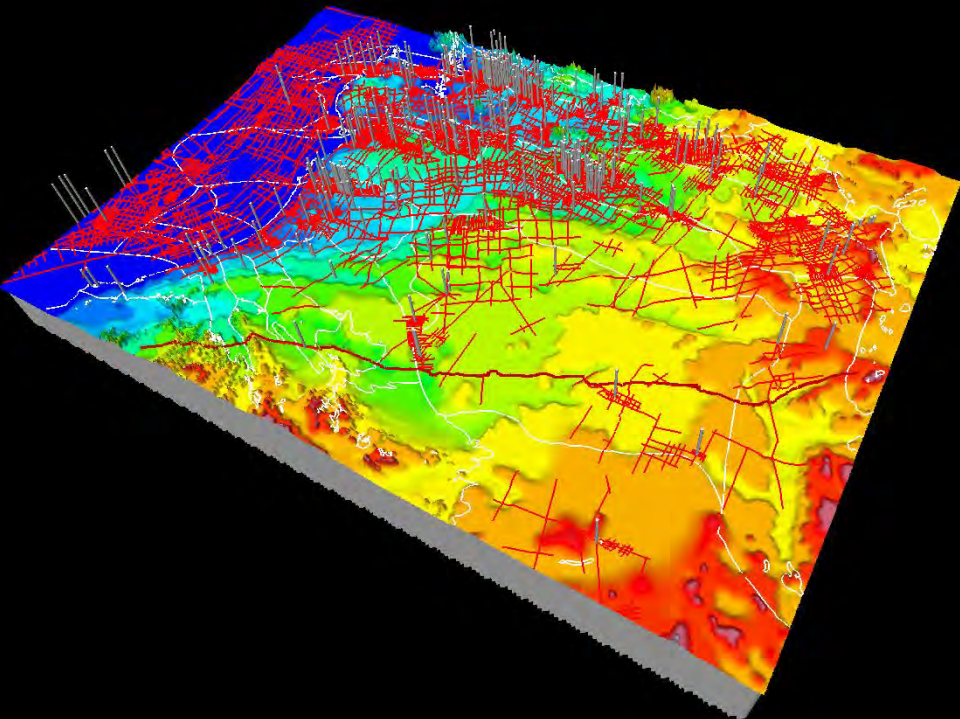
Nifty



Telfer



Summary



Kidson Sub-basin Seismic Survey

Project funding	EFTF (Commonwealth govt, GA) & EIS (WA State govt, GSWA)
Acquisition coverage	872 km, 20 seconds
Acquisition duration	17th June to 7th August 2018
Data availability	Access via GA's data repository or GSWA's WAPIMS